



**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

In re Patent Application of

TREEN et al.

Atty. Ref.: 124-926

Serial No. 10/069,461

TC/A.U.: 2859

Filed: February 26, 2002

Examiner: Richard A. Smith

For: PRESSURE INDICATOR

Confirmation No.: 3390

May 26, 2004

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

APPEAL BRIEF

Sir:

Appellants hereby appeal to the Board of Patent Appeals and Interferences from
the last decision of the Examiner.

I. REAL PARTY IN INTEREST

The real party in interest in the above-identified appeal is QinetiQ Limited by
virtue of an Assignment from the inventors to QinetiQ Limited recorded February 26,
2002, at Reel 12843, Frame 0719.

II. RELATED APPEALS AND INTERFERENCES

There are believed to be no related appeals or interferences with respect to the
present application and appeal.

III. STATUS OF CLAIMS

Claims 2-23 stand rejected in the outstanding Final Rejection. The Examiner contends that all claims are either anticipated under 35 USC §102 or obvious under 35 USC §103 in view of the cited prior art.

IV. STATUS OF AMENDMENTS

No further response has been submitted with respect to the Final Official Action in this application.

V. SUMMARY OF EXAMPLES OF THE INVENTION

For purposes of example, and without limitation, certain exemplary embodiments of this invention relate to a pressure indicator that can be used to provide an indication of the pressure within a vessel, e.g., a tire, a football, etc.

According to one embodiment, see, e.g., Figures 2a through 2f, the pressure indicator includes two flexible diaphragms 4, 5 that form first and second outer surfaces of the pressure indicator.* The diaphragms 4, 5 are coupled so as to form a compartment 6 within the pressure indicator. One of the diaphragms 5 acts as an indicator, and bears a recognisable configuration or pattern, e.g., diamond 7, and the other diaphragm 4 acts as the display. When a change in pressure is applied to one of the outer surfaces of the

* In paragraph 1 of the Final Rejection, it is asserted that the drawings do not show a flexible indicator diaphragm. Contrary to that assertion, Figures 2a, 2b and (corrected) Figure 2c show progressive movement of indicator diaphragm 5 under increasing pressure. Moreover, either diaphragm may comprise, e.g., a flexible polymer or elastomer. See page 2, lines 20-22 of the original specification and current claim 14.

pressure indicator, relative movement between the diaphragms 4, 5 causes the pattern or configuration on the indicator diaphragm to become visible through the display diaphragm. See page 4, line 25 – page 5, line 18 of the instant application.

The resulting device is a simple and lightweight pressure indicator that can be used in a variety of applications. The device is particularly suitable for incorporation in an inflatable object, and may, for example, be placed between the inner and outer skins of an object such as a ball, so as to indicate the object's internal pressure. In such an application, the inherent simplicity and flexibility of the device is of significant benefit.

In other embodiments, e.g., Figures 4a-4c, the pressure indicator comprises an indicator diaphragm bearing a recognisable configuration or pattern coupled to, and in fluid communication with, a display diaphragm, wherein the display diaphragm comprises a lenticular material 20. As a result of its diffractive and reflective properties, the lenticular material causes the display diaphragm to appear "silvery" in its uncompressed state (see, e.g., page 6 lines 12-14 of the instant specification), but allows it to become transparent upon a certain amount of compression (page 6, lines 18-19).

Compression of the lenticular material is caused by a change in pressure applied to at least one of the diaphragms, which change in pressure causes the indicator diaphragm to compress the lenticular material 20. At a certain amount of compression, determined by the required application, the lenticular material 20 becomes transparent and the recognisable configuration or pattern on the indicator is revealed. The present inventors

have found that, by using a display diaphragm of this type, a pressure indicator having a particularly precise pressure response can be produced, without the need for liquids and gels in the pressure indicator compartment.

VI. ISSUES

Whether claims 14, 17, 19 and 20 are anticipated by Conrad (U.S. Patent 4,722,451).

Whether claim 23 is anticipated over Travisano (U.S. Patent 4,877,143).

Whether claims 7, 10, 14, 17 and 19-21 are obvious over Travisano in view of Ruschke *et al.* (U.S. Patent 5,827,429).

Whether claims 2-5, 7-9, 14, 17, 19 and 20 are obvious over Popenoe (U.S. Patent 5,189,979) in view of Ruschke *et al.*

VII. GROUPING OF CLAIMS

The claims have been divided into the following groups which are patentably distinct from one another:

Group A: Independent claim 19 and dependent claims 2-18 and 20-22; and

Group B: Independent claim 23.

For example, claim 23 is patentably distinct from all other claims. In addition, claims 2-22 are patentably distinct from claim 23.

VIII. ARGUMENT

It is axiomatic that in order for a reference to anticipate a claim, it must disclose, teach or suggest each and every feature recited in the claim. See, e.g., *Kalman v. Kimberly-Clark Corp.*, 713 F.2d 760, 218 USPQ 781 (Fed. Cir. 1983). The USPTO has the burden in this respect.

Moreover, the USPTO has the burden under 35 USC Section 103 of establishing a *prima facie* case of obviousness. *In re Piasecki*, 745, F.2d 1468, 1471-72, 223 USPQ 785, 787-88 (Fed. Cir. 1984). It can satisfy this burden only by showing that some objective teaching in the prior art, or that knowledge generally available to one of ordinary skill in the art, would have led that individual to combine the relevant teachings of the references to arrive at the claimed invention. *In re Fine*, 837 F.2d 1071, 1074, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). Before the USPTO may combine the disclosures of the references in order to establish a *prima facie* case of obviousness, there must be some suggestion for doing so. *In re Jones*, 958 F.2d 347 (Fed. Cir. 1992). Even assuming, *arguendo*, that a given combination of references is proper, the combination of references must in any event disclose the features of the claimed invention in order to render it obvious.

A. Conrad Does Not Anticipate Independent Claim 19 (with which dependent claims 14, 17 and 20 stand/fall)

Claims 14, 17, 19 and 20 stand rejected under 35 USC §102(b) as being anticipated by Conrad.

Independent claim 19 is directed to a flexible pressure indicator comprising, *inter alia*, a flexible display diaphragm, and a flexible indicator diaphragm bearing a recognisable configuration or pattern. The display diaphragm and the indicator diaphragm, respectively, form first and second opposing outer surfaces of the pressure indicator, with the diaphragms forming a compartment within the indicator. A change in pressure applied to at least one of the outer surfaces of the pressure indicator causes relative movement between the diaphragms such that, at a certain degree of compression, the pattern or configuration on the indicator diaphragm becomes visible through the display diaphragm.

By contrast, Conrad is directed to a one-shot tamper indicator for a container 10 having an inner chamber 18 that is hermetically sealed under vacuum pressure after being filled with product and capped. Container 10 includes interior and exterior walls 24 and 26, respectively, with the interior wall 24 being subject to the vacuum and the exterior wall being subject to ambient pressure. Zone 32 of walls 24, 26 is deformable upon release of the vacuum seal, e.g., upon opening of cap 22. In particular, zone 32 moves from a recessed position in Figure 2 to an extended position as shown in Figure 4, upon

release of the vacuum. In Figure 4, zone 32 may force a tear in frangible label 34 (made of paper), to provide a visual indication of vacuum loss due to, for example, tampering. See column 3, lines 35-49 and column 4, lines 9-12.

As such, Conrad does not disclose the claimed subject matter.

First, Conrad does not teach a flexible display diaphragm and a flexible indicator diaphragm, as recited in claim 19. While the zone 32 is deformable, the frangible paper label 34 is not flexible. Frangible paper label 34 is intended to be torn when zone 32 moves to the extended position, to thereby indicate a broken vacuum seal. If label 34 were made to be flexible, it is possible that it would not tear upon abutment with zone 32. Instead, the label 34 would possibly move with zone 32. In effect, if made flexible, label 34 may not necessarily provide any indication of the condition of vacuum seal, e.g., tampering, etc.

Second, Conrad does not disclose an indicator diaphragm bearing a recognisable configuration or pattern. The Final Rejection points to element “20” of Conrad as corresponding to the claimed pattern, but Conrad does not have any reference number 20.

Third, Conrad does not disclose that the pattern or configuration of the flexible indicator diaphragm is visible through the display diaphragm, as recited in claim 19. In Conrad, zone 32 is either visible once the frangible paper label 34 has been torn, or zone 32 is directly visible if (optional) label 34 is not provided. See Col. 4, lines 15-17. Thus, the indicator diaphragm is not visible through the display diaphragm, as recited.

Fourth, Conrad does not teach that the indicator and display diaphragms form first and second opposing outer surfaces of the pressure indicator. Because zone 32 of Conrad is formed as an integral component of container 10, it does not form an outer surface of the pressure indicator.

For at least the foregoing reasons, it is respectfully submitted that the rejection of claim 19 (and dependent claims 14, 17 and 20) over Conrad should be reversed.

B. Travisano Does Not Anticipate Claim 23

Claim 23 stands rejected under 35 USC §102(b) as being anticipated by Travisano.

Claim 23 is directed to a pressure indicator comprising, *inter alia*, a display diaphragm and an indicator diaphragm. The indicator diaphragm is coupled to and in communication with the display diaphragm. The display diaphragm comprises a lenticular material and the indicator diaphragm bears a recognisable configuration or pattern. A change in pressure applied to at least one of said diaphragms causes relative movement between the diaphragms compressing the lenticular material, causing an image of said recognisable configuration or pattern to be externally visible through said display diaphragm.

By contrast, Travisano discloses a one-shot indicator 10 designed to be used as a tamper evident seal on a vacuum container. The indicator 10 includes a first component 11 in the form of a rigid member formed, at least in its central portion, of translucent material, and a second component 12 which is a resilient member that is distendable or

deformable when its opposite surfaces are subjected to a pressure differential. Col. 3, lines 12-18. Member 11 includes a light diffusion surface 15, such as a matte surface or a surface formed with a negative Fresnel lens. Col. 3, lines 45-48. In operation, the light diffusion surface 15 merely obscures the indicia on member 12 until member 12 is close enough to member 11 for the indicia to be clearly visible.

In contrast, claim 23 recites a display diaphragm comprising a lenticular material. In an uncompressed state, the diaphragm appears silvery, as a result of the diffractive and relective properties of the lenticular materials. The lenticular material is described on pages 6-7 of the present specification. See also, e.g., Figures 4a-4c. The lenticular material is compressed upon relative movement of the diaphragms, causing an image of the configuration or pattern of the indicator diaphragm to be externally visible through the display diaphragm.

The use of compression to alter the optical properties of the display diaphragm is entirely different to Travisano, where the rigid member 11 remains unchanged in its optical properties. Thus, the pressure indicator recited in claim 23 is neither anticipated nor suggested by Travisano.

For at least the foregoing reasons, it is respectfully submitted that the rejection of claim 23 should be reversed.

- C. Claim 19 (with which dependent claims 7, 10, 14, 17, 20 and 21 stand/fall)
Are Not Obvious Over Trivisano in view of Ruschke *et al.* Under 35 USC
§103(a)

As mentioned above, Trivisano discloses a one-shot device designed to be used as a tamper evident seal on a vacuum container. Contrary to the Examiner's assertion, the device disclosed by Trivisano does not disclose a flexible pressure indicator having display and indicator diaphragms that respectively form first and second opposing outer surfaces of the pressure indicator. In Trivisano, resilient member 12 is required to be secured in an air-tight manner across an aperture provided in the container or package (see, for example, column 4 lines 3-6 and column 3 lines 57-61) and, therefore, is required to be an integral part of said container or package. Thus, member 12 does not form an outer surface of the pressure indicator, as claimed. Ruschke *et al.* does not make up for this deficiency, and was not even relied upon for such.

Moreover, as admitted in the Office Action, Trivisano fails to teach or disclose a flexible display diaphragm. To make up for this deficiency, the Office Action relies on Ruschke *et al.*, which has been cited in respect of replacing the translucent rigid plastic member 11 taught by Trivisano with a flexible display diaphragm.

However, Ruschke *et al.* is not eligible for combination with Trivisano because it does not satisfy the definition of "analogous art." In particular, in order to rely on a reference as a basis of rejection of the applicant's invention, "the reference must either be

in the field of the applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the inventor was concerned." See *In re Oetiker*, 977 F.2d 1443, 1444, 24 USPQ2d 1443, 1145-46 (Fed. Cir. 1992). Ruschke *et al.* is in the field of intravenous filter devices and therefore not in Appellants' field of pressure indicators. Ruschke *et al.* is concerned with providing filter devices in the medical area – far removed from the problems with which Appellants were confronted - reliably providing an indicator of pressure in various applications. The use of flexible materials in Ruschke *et al.*'s filter housing 10 (column 5, line 61-column 6, line 9) has no relation to pressure indicators. While the fluid within housing may be under pressure, the housing material provides no indication of pressure.

Moreover, even if Ruschke *et al.* does qualify as an analogous reference, which it does not, Appellants respectfully point out that that Ruschke *et al.* appears only to have been cited by the Examiner with the benefit of impermissible hindsight. Given that one of ordinary skill would not, in reality, have consulted art relevant to intravenous filter devices, Appellants respectfully submit that it is impermissible to attempt to combine the teachings of Travisano with those of Ruschke *et al.*

Notwithstanding that point, it is submitted that the skilled person would have no reason, upon reading Travisano, either alone or in combination with Ruschke *et al.*, to alter the rigid light diffusion element of the vacuum container, in particular to make the element 11 flexible. If member 11 were flexible, the distance between the elements 11

and 12 could be unpredictable, thereby rendering the tamper-proof device unreliable. Thus, claim 19 is patentable over Trivisano in view of Ruschke *et al.* Claims 7, 10, 14, 17, 20 and 21 are patentable by virtue of their dependency on claim 19, at least for purposes of this appeal.

For at least the foregoing reasons, it is respectfully submitted that the rejection of claim 19 and dependent claims 7, 10, 14, 17, 20 and 21 should be reversed.

D. Claim 19 (with which dependent claims 2-5, 7-9, 14, 17 and 20 stand/fall)
Are Not Obvious Over Popenoe in view of Ruschke *et al.* Under 35 USC
§103(a)

Claim 19 and dependent claims 2-5, 7-9, 14, 17 and 20 have been rejected as obvious over Popenoe '979 in view of Ruschke *et al.* In that regard, Appellants again wish to point out the impropriety of combining Ruschke *et al.* with prior art such as Popenoe. Ruschke *et al.* is not in the same field of endeavor, and nor does Ruschke *et al.* deal with the same problems that confronted Appellants. Thus, Ruschke *et al.* does not qualify as analogous art. Even if it does qualify as an analogous reference, which it does not, any motivation to combine Ruschke *et al.* (a filtering device) with Popenoe (a pressure indicator) is based on impermissible hindsight.

Appellants further wish to point out the inconsistent successive interpretations that the PTO has applied to Popenoe, particularly in respect of which feature is regarded as forming the display diaphragm.

In the latest interpretation of Popenoe, the Office Action alleges that transparent window 21 and flexible indicator diaphragm 16 form respective first and second opposing outer surfaces of the pressure indicator, and goes on to cite Ruschke *et al.* merely in respect of replacing the rigid display window with a flexible display window. With regard to the first of those points, Appellants respectfully submit that the indicator diaphragm and display window of Popenoe are merely elements of a much larger arrangement of components, and that the indicator diaphragm 16 clearly does not form an outer surface of the pressure indicator, as claimed. Popenoe teaches that pressure indicator 10 comprises a housing 11. See col. 3, lines 5-6. Thus, the flexible diaphragm 16 does not form an outer surface of the pressure indicator 10. Moreover, Popenoe does not describe a flexible pressure indicator *per se*, as recited in claim 19 (line 1).

Thus, even if the skilled person were motivated to replace the rigid display window of Popenoe with a flexible display window according to Ruschke *et al.*, the skilled person would still not arrive at the self-contained pressure indicator specified in claim 19. Appellants submit, therefore, that claim 19 is patentable over Popenoe in view of Ruschke *et al.* Dependent claims 2-5, 7-9, 14, 17 and 20 are patentable by virtue of their dependency on claim 19, at least for the purposes of this appeal.

For at least the foregoing reasons, it is respectfully submitted that the rejection of claim 19 and dependent claims 2-5, 7-9, 14, 17 and 20 should be reversed.

D. The Remaining Rejections Under 35 USC §103(a)

The Examiner has rejected claim 6 as obvious over Popenoe and Ruschke *et al.* in view of US 3,738,311 to Appleton; claims 10 to 13 as obvious over Popenoe and Ruschke *et al.* in view of U.S. Patent 3,602,186 (also to Popenoe); and claims 15, 16, 18 and 22 as obvious over US 5,755,634 to Huang in view of Popenoe ('979) and Ruschke *et al.* Appellants submit that all of those dependent claims stand/fall with independent claim 19. To the extent that the rejection of Huang is applied to independent claim 19, the arguments regarding Ruschke *et al.* are also applicable, i.e., Ruschke *et al.* is not analogous art because it is not in the same field of endeavor as Huang, and Ruschke *et al.* does not deal with the same problems that confronted the present inventors, as described in more detail above. Moreover, any motivation to combine Ruschke *et al.* with Huang is based on impermissible hindsight.

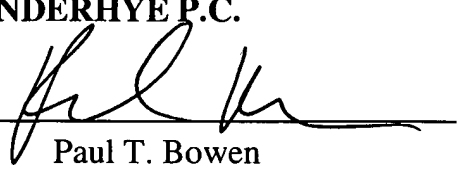
IX. CONCLUSION

Thus, in view of the above, the rejections of claims 2-23 are clearly in error and reversal thereof by this Honorable Board is respectfully requested.

Respectfully submitted,

NIXON & VANDERHYE P.C.

By: _____


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PTB:jck
Enclosure
Appendix - Claims on Appeal

APPENDIX

Claims on Appeal

2. A pressure indicator as claimed in claim 19 further comprising a means to amplify the relative movement between the diaphragms which results from the change in pressure.

3. A pressure indicator as claimed in claim 2 wherein the means to amplify the change in pressure comprises

an article having a first surface and a second surface, the second surface having a larger cross sectional area than the first surface;

wherein the first surface is in fluid communication with one of the diaphragms and in use, a change in pressure applied to the second surface causes an amplified movement of the first surface.

4. A pressure indicator as claimed in claim 3 wherein the first surface comprises the indicator diaphragm.

5. A pressure indicator as claimed in claim 3 further including a rigid structure and means for biasing the second surface against the rigid structure.

6. A pressure indicator as claimed in claim 5 wherein the biasing means comprises one of a spring and elastomeric material.

7. A pressure indicator as claimed in claim 19 wherein the display diaphragm is transparent.

8. A pressure indicator as claimed in claim 19 wherein the compartment contains a liquid or gel.

9. A pressure indicator as claimed in claim 8 wherein the liquid or gel is at least partially opaque.

10. A pressure indicator as claimed in claim 19 wherein the recognisable configuration or pattern comprises a symbol or graphic projecting from the surface of the indicator diaphragm towards the display diaphragm.

11. A pressure indicator as claimed in claim 19 wherein the configuration or pattern comprises at least two components, each component contacting the display diaphragm at different pressures.

12. A pressure indicator as claimed in claim 11 wherein the at least two components have different colours.

13. A pressure indicator as claimed in claim 11 wherein the at least two components have different visibility.

14. A pressure indicator as claimed in claim 19 wherein at least one of the display diaphragm and the indicator diaphragm comprises a flexible polymer.

15. An apparatus comprising a fluid reservoir and a pressure indicator according to claim 19 wherein one of the diaphragms is in fluid communication with the fluid reservoir.

16. An apparatus according to claim 15 wherein the apparatus is inflatable.

17. A method of indicating fluidic or mechanical pressure using a pressure indicator according to claim 19.

18. A ball comprising a pressure indicator as claimed in claim 19.

19. A flexible pressure indicator, wherein the pressure indicator comprises:
a flexible display diaphragm, and,
a flexible indicator diaphragm bearing a recognisable configuration or pattern,
wherein said display diaphragm and said indicator diaphragm, respectively, form first and second opposing outer surfaces of said pressure indicator, said diaphragms forming a compartment within said indicator, and wherein a change in pressure applied to at least one of the outer surfaces of the pressure indicator causes relative movement between the diaphragms such that, at a certain degree of compression, the pattern or configuration on the indicator diaphragm becomes visible through the display diaphragm.

20. A pressure indicator as claimed in claim 14 wherein at least one of the display diaphragm and the indicator diaphragm comprises an elastomer.

21. A pressure indicator as claimed in claim 19 wherein the display diaphragm comprises a lenticular material that, upon a certain amount of compression, becomes transparent to reveal the image on the indicator diaphragm.

22. An inflatable object comprising a pressure indicator as claimed in claim 19.

23. A pressure indicator comprising:
a display diaphragm; and
an indicator diaphragm, said indicator diaphragm coupled to and in communication with the display diaphragm, wherein the display diaphragm comprises a lenticular material and the indicator diaphragm bears a recognizable configuration or pattern, and wherein a change in pressure applied to at least one of said diaphragms causes relative movement between the diaphragms compressing said lenticular material causing an image of said recognizable configuration or pattern to be externally visible through said display diaphragm.